Traffic Assessment

25-27 Warriewood Road, Warriewood

Proposed Residential Development

Knowles Group Pty Ltd

Revision Record

No.	Author	Reviewed	Description	Date
1.	Paul Cai	Baqir Husain	Rev 01	12.05.2020
2.	Paul Cai	Baqir Husain	Rev 02	22.05.2020
3.	Paul Cai	Baqir Husain	Rev 03	26.05.2020
4.				
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Contents

Table Index

Figure Index

1 Introduction

TTM Consulting was engaged by Knowles Group Pty Ltd to prepare a traffic engineering report investigating a proposed residential unit and townhouse development at 25-27 Warriewood Road, Warriewood NSW.

It is understood that a development application will be lodged with Northern Beaches Council (formerly Pittwater Council).

1.1 Scope

This report investigates the transport aspects associated with the proposed development. The scope investigated includes:

- Parking supply required to cater for development demand.
- Parking layout to provide efficient and safe internal manoeuvring.
- Identification of likely traffic volumes and traffic distribution from the future development.
- Identification of likely traffic impact of development on the public road network.
- Access configuration to provide efficient and safe manoeuvring between the site and the public road network.
- Access to suitable levels of public transport.

The development plans have been assessed against the following:

- Pittwater Council: Development Control Plan (DCP) 2015.
- Warriewood Valley Roads Masterplan 2018.
- Warriewood Valley Strategic Review Report (2012).
- Warriewood Valley Strategic Review Addendum Report (2014).
- Australian Standard (AS 2890).
- RTA (RMS) Guide to Traffic Generating Developments.

1.2 Development profile

The proposed residential development contains:

- 11 residential townhouses (including 3 adaptable units).
- 32 residential units (including 8 adaptable units):
  - 4 x one bedroom units
  - 22 x two bedrooms units
  - 6 x three bedrooms units
  - One basement level car park.

The proposed basement car park has a total of 60 car parking spaces (including 8 adaptable spaces) and 1 car wash bay.

11 visitor parking spaces (including one accessible space) will be provided on the proposed laneway adjacent to the residential flat building.

16 bicycle parking spaces are proposed in addition to the car parking spaces.

Each townhouse will be allocated with three car spaces within a garage as part of each lot.

1.3 Site location

The site is located at 25-27 Warriewood Road, as shown in Figure 1-1. It has road frontages to Warriewood Road and Lorikeet Grove. The site is currently undeveloped. An Aged Care Facility has been constructed at the south boundary of the site and the extension of Lorikeet Grove has also been constructed (see Figure 1-1).

Figure 1-1: Site location

It is understood that the adjacent site at 29-31 Warriewood Road has current approval for residential subdivision to provide 40 lots. Eleven of the residential lots will have direct access to Warriewood Road. The remaining 29 lots will access the local road network via the proposed extension of Lorikeet Grove as shown in Figure 1-2.

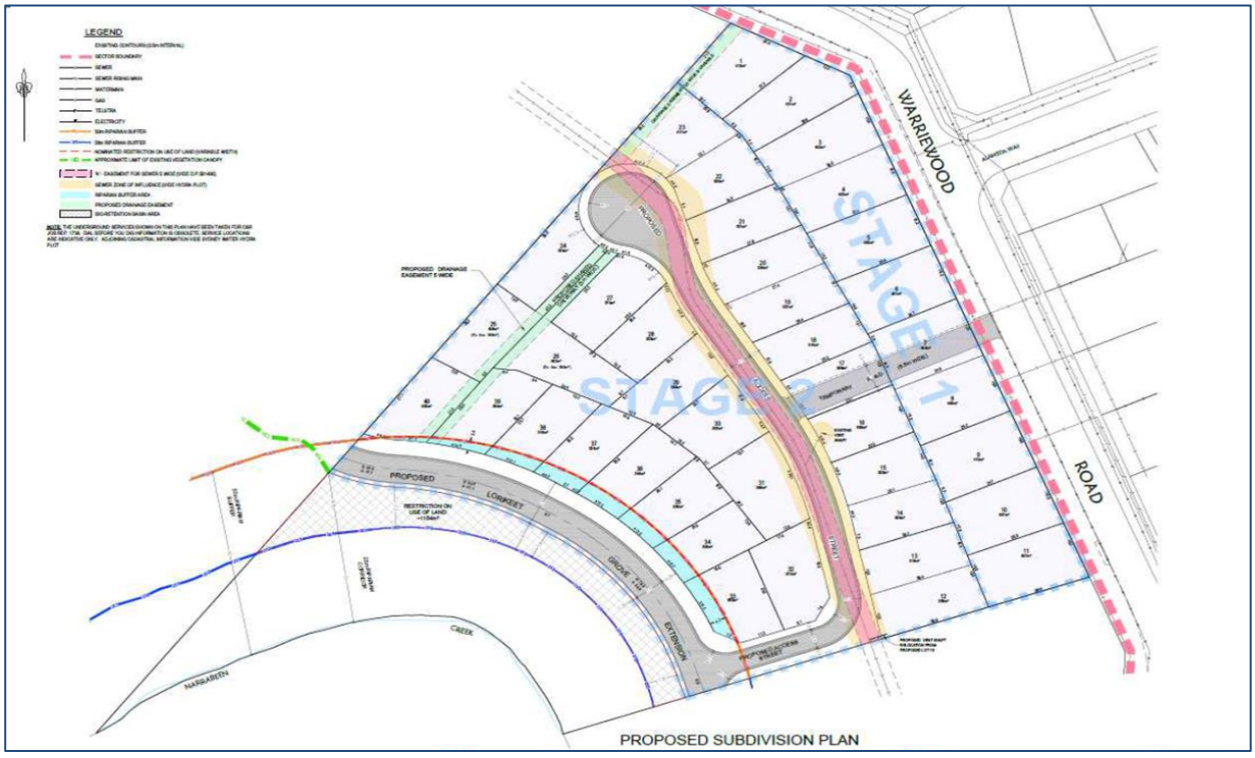

Figure 1-2: 40 Lot subdivision at 29-31 Warriewood Road[1]

1.4 Warriewood Valley Roads Masterplan (2018)

The Warriewood Valley Roads Masterplan (2018) sets out Council's plans for the road system including road cross sections, traffic calming and management, and pedestrian and cycle routes within the Warriewood Valley Precinct.

The Masterplan includes an indicative road network. It also identifies an off road shared pedestrian and cycleway path along Warriewood Road.

Warriewood Roads Release Area - Landscape Masterplan and Design Guidelines (Public Domain) specifies the hierarchy for vehicle and pedestrian links. This plan includes an indicative location for a road running from the planned Lorikeet Grove extension through to the intersection of Warriewood Road and Hill Street. The extension of Lorikeet Grove to Hill Street has been constructed as indicated in the plan.

[1] Source: *Proposed Residential Subdivision 29-31 Warriewood Road Warriewood – Traffic Impact Assessment 16 April 2013 prepared by Ray Dowsett Traffic and Transport Planning Pty Ltd*

Figure 1-3: Indicative location of road running from Lorikeet Grove extension through to Warriewood Road and Hill Street[2]

[2] Source: Northern Beaches Council – Pittwater, Warriewood Valley Release Area – Landscape Masterplan and Design Guidelines (Public Domain) November 2016, viewed 18th September 2018.

2 Existing Transport Network and Traffic Situation

2.1 Road network

The subject site has street frontages to Warriewood Road and Lorikeet Grove. Extension of Lorikeet Grove has been constructed. New Laneway for access to the townhouses is yet to be constructed. The roads in the vicinity of the site are maintained by Northern Beaches Council. The local road characteristics are summarised in Table 2-1.

Table 2-1: Road characteristics

Road	Speed Limit	Lanes	Road Authority
Warriewood Road	50kph	2 (undivided, plus parking)	Council
Hill Street	50kph	2 (undivided, plus parking)	Council
Lorikeet Grove	50kph	2 (undivided, plus parking)	Council
Laneway (future road)	40 or 50kph (to be determined by Council)	2 (undivided, plus parking)	Council

Warriewood Road has a 12-metre-wide carriageway at the site frontage. The intersection of Warriewood Road/Hill Street and the intersection of Warriewood Road/ Macpherson Street are roundabout intersections.

Warriewood Road, in conjunction with Foley Street to the north, forms a connection between Pittwater Road and Mona Vale Road with traffic signals controlling access at each intersection.

As part of the development of the aged care facility, a public road linking Warriewood Road to the planned extension of Lorikeet Grove has been constructed (see Figure 2-1). Lorikeet Grove has a carriageway width of 7.5 metres. The proposed residential flat building will have access driveway on Lorikeet Grove to the basement carpark.

A proposed laneway will be constructed to provide access from Lorikeet Grove to the proposed townhouses' access driveway. The average carriageway width of the laneway is 7 metres.

Figure 2-1: Lorikeet Grove (facing east)

2.2 Assessment of existing travel options

2.2.1 Public transport

Bus stops are located on Macpherson Street and Warriewood Road fronting the development site, with services to / from Sydney CBD and Warriewood / Mona Vale. Sydney Buses operates bus routes 185 and 185X servicing the site. Bus route network diagram near the site is shown in Figure 2-2.

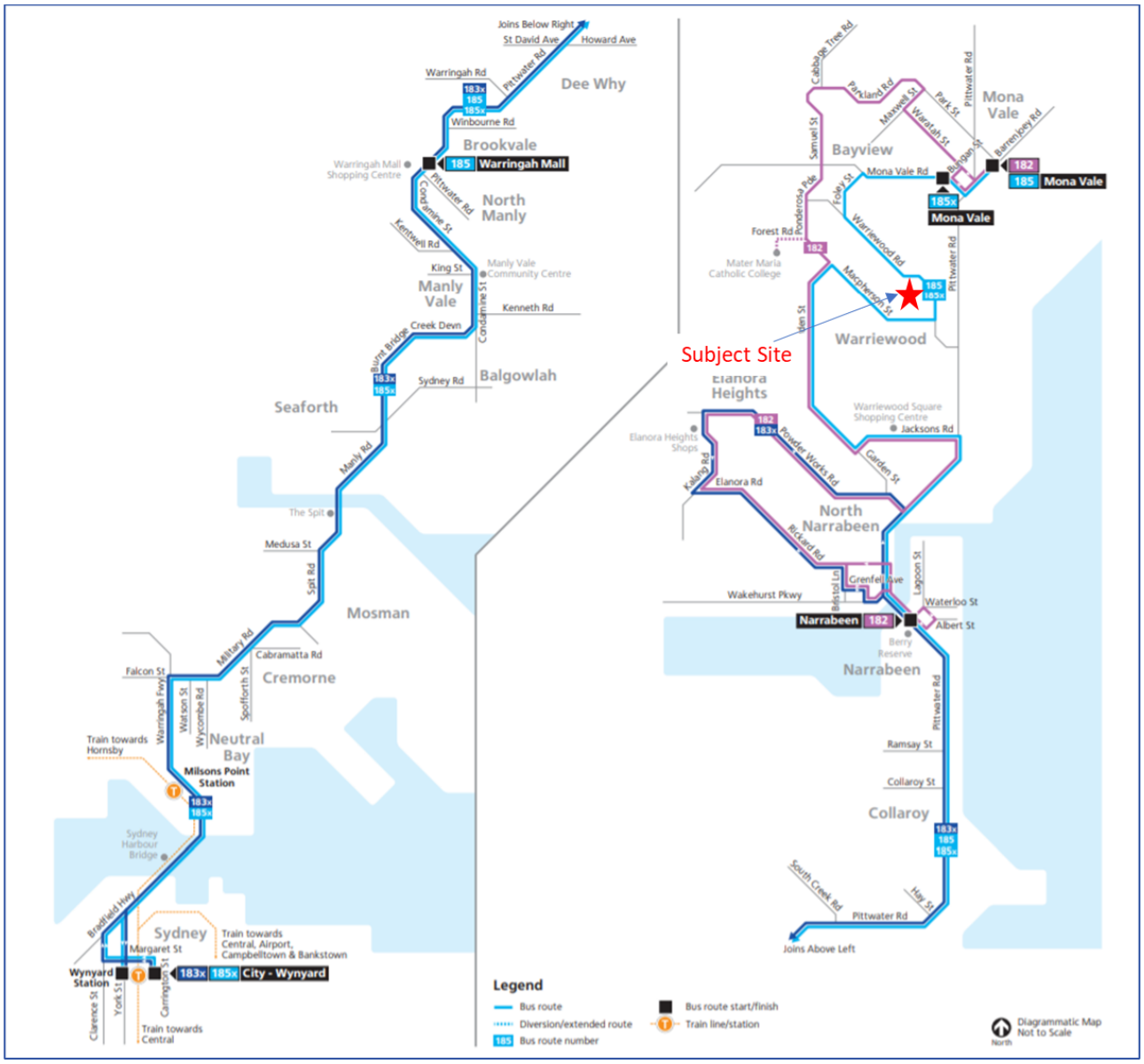

Figure 2-2: Bus route 185 and 185X (Mona Vale to City Wynyard via Warriewood) network diagram[3]

[3] Source: Transport NSW Website (http://www.transportnsw.info/)

2.2.2 Walking and cycling infrastructure

Formal pedestrian paths are provided along the site frontage on Warriewood Road and Lorikeet Grove as shown in Figure 2-3 and Figure 2-4 .

Figure 2-3: Pedestrian footpath along the site frontage on Warriewood Road

Figure 2-4: Pedestrian footpath on Lorikeet Grove

There are limited dedicated cycle ways within the vicinity of the site as presented in Figure 2-5.

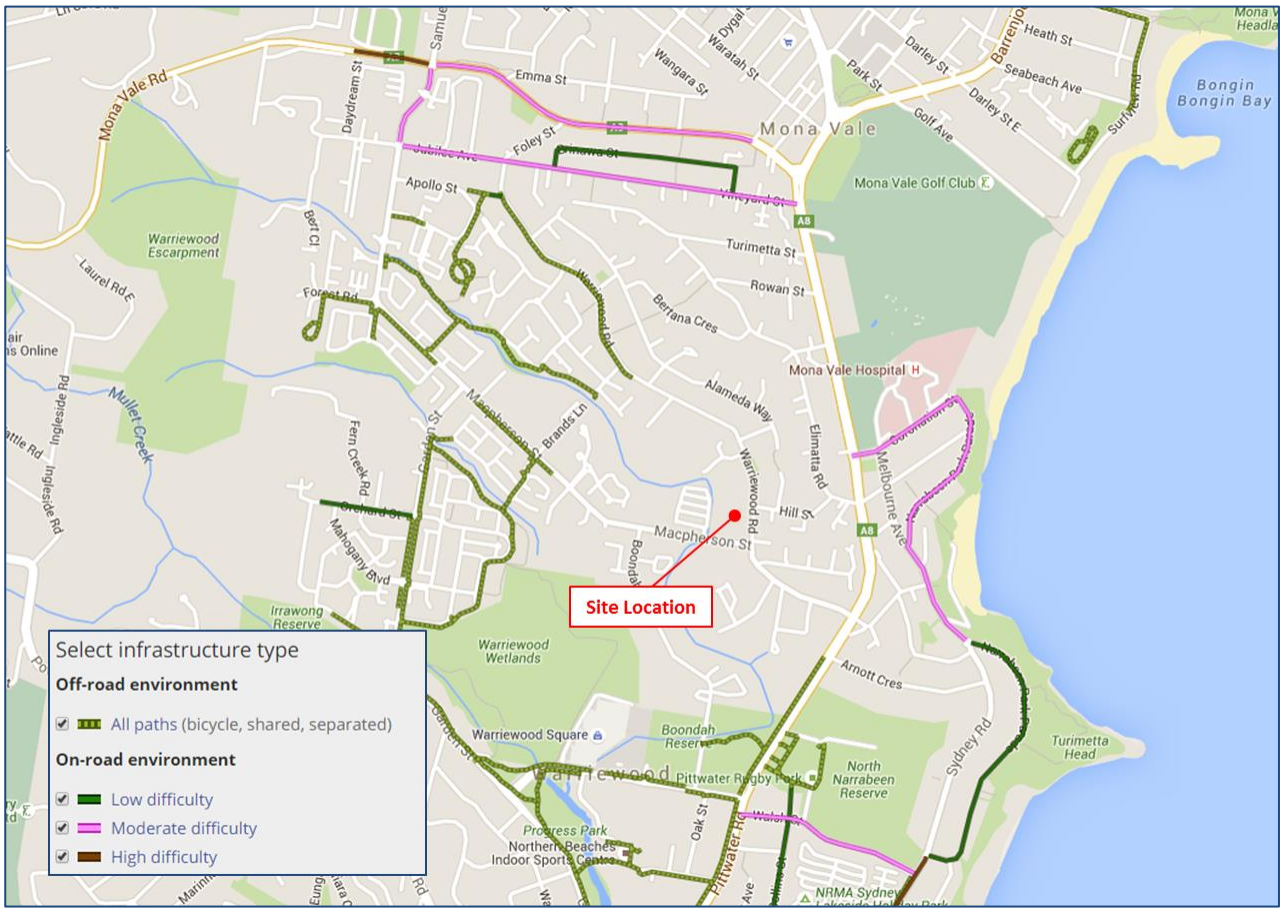

Figure 2-5: RMS Cycle Network[4]

Pittwater Council Road Reserve Walking Plan and Cycle sub plan identities existing and proposed footpaths and shared paths in the vicinity of the site (see Figure 2-6).

[4] Source: NSW Road Maritime Services Website: http://www.rms.nsw.gov.au/roads/using-roads/bicycles/cyclewayfinder/index.html

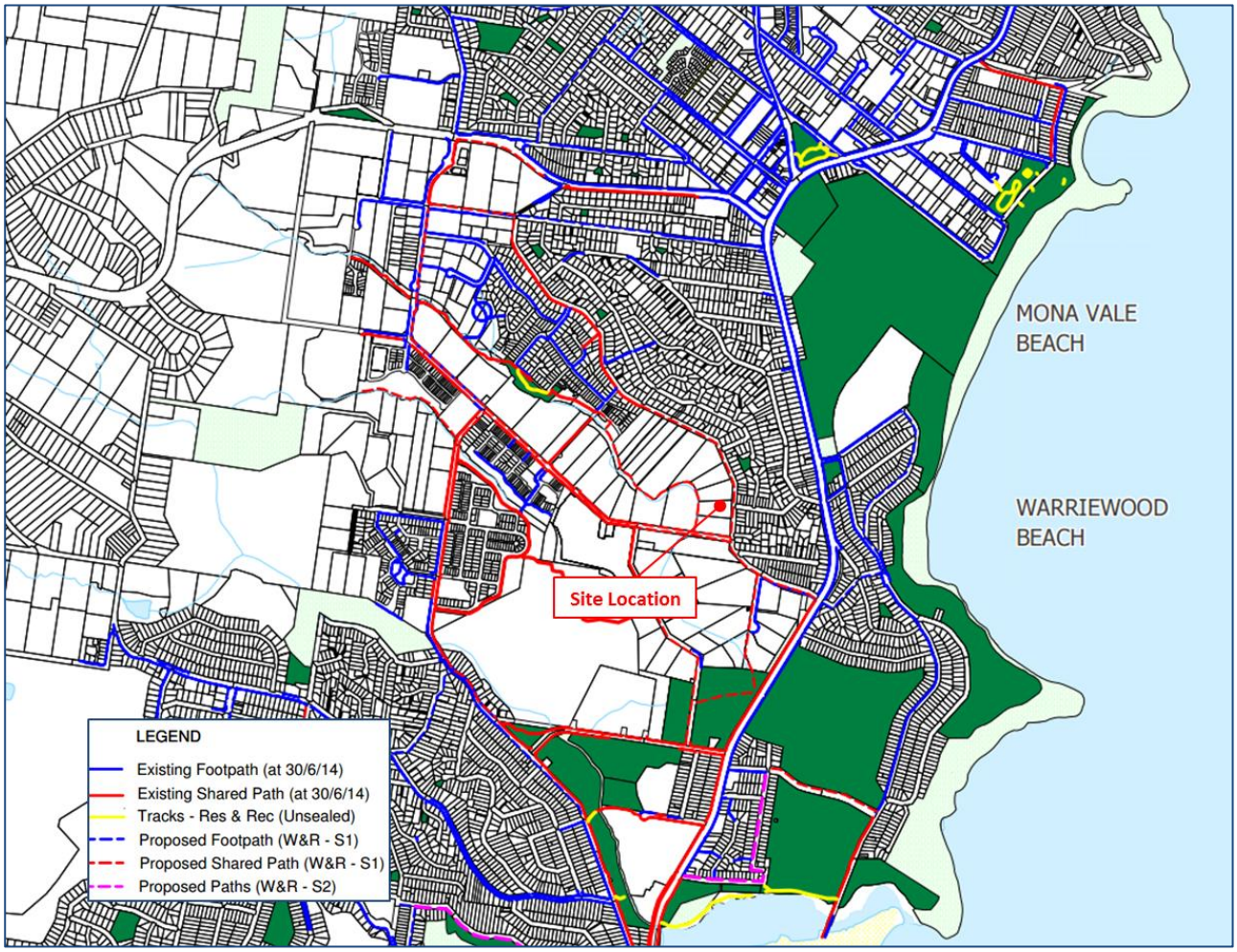

Figure 2-6: Existing and proposed footpaths and shared paths in the vicinity of the site[5]

[5] Source: Northern Beaches Council- Pittwater, 2014, *Road Reserve Walking Sub Plan and Cycle Sub Plan Map*, viewed 1st September 2016, http://portal.pittwater.nsw.gov.au/common/Output/DataworksAccess.aspx?id=z%252bgvDiTtU4M%253d&ext=pdf

3 Parking

3.1 Council car parking requirements

Councils parking requirement for this type of development are identified in 'Pittwater 21 Development Control Plan (DCP) 2015 – Part B6.3 Off-Street Vehicle Parking Requirement' is presented in Table 3-1.

Table 3-1: Councils parking requirements

Land Use	Units	Minimum Parking Rates
Residential Flat Building	1 bedroom	1 space per dwelling
	2 bedrooms or more	2 spaces per dwelling
	Visitor parking	1 space per 3 dwellings
	Car wash bay	1 for development with 10 or more dwellings
Dwellings/Town Houses	2 bedrooms or more	2 spaces per dwelling

Table 3-2 presents the parking requirements for compliance with the Councils DCP.

Table 3-2: Proposed development car parking supply (Council rates)

Development Type	Number of bedrooms	Council Minimum Parking Supply	Proposed Car Parking Provision
Residential Flat Building	4 x one bedroom	4.0	60 (including 8 adaptable spaces)
	22 x two bedrooms	44.0	
	6 x three bedrooms	12.0	
	Visitor parking	10.7	11
	Car wash bay	1	1
	Total	**70.7**	**72**
Townhouses	11 x three bedrooms	**22**	**33**

Indented on-street car parking spaces has been constructed on Lorikeet Grove. This is in addition to the 11 visitor parking spaces provided on the proposed laneway.

3.2 Accessible bay requirements

Pittwater 21 DCP Part B and Part C requires that the provision of parking for people with disabilities must be provided at a rate of 3% of the required parking spaces, excluding parking required for Adaptable Housing.

The accessible car parking requirements are summarised in Table 3-3.

Table 3-3: Accessible parking rate requirements (Pittwater 21 DCP 2014)

Accessible Parking Requirement	Required number of parking spaces		Number of Accessible Parking Spaces to be Provided on Site
3% of the required car parking spaces (min one accessible parking space)	Residential Flat Building (excluding 8 adaptable housing parking)	63	1.89 (round up to 2)

8 adaptable parking bays are provided within the basement car park for the proposed residential units. These 8 adaptable bays will be assigned to the 8 proposed adaptable units. The adaptable bays are designed in accordance with Australian Standard AS4299-1995: Adaptable Housing, with a width of 3.8 metres. This width enables a person with a wheelchair to get in and out of both the car and the parking space. It is our advice that these 8 adaptable parking bays will accommodate parking requirements for the 8 adaptable units.

One accessible parking bay is provided off the proposed laneway for visitor parking. This accessible parking bay is designed in accordance with AS2890.6.

It is our advice that the provision and arrangement of adaptable parking bays and visitor accessible parking bay will satisfy the parking requirements for people with disabilities.

3.3 Bicycle parking requirements

Council bicycle parking requirements for this type of development are identified in 'Pittwater 21 DCP 2015' states:

> *'for residential development (other than a dwelling house, dual occupancy, secondary dwellings, exhibition homes and rural workers' dwellings), secure bicycle storage facilities must be provided within the building at the rate of 1 bicycle rack per 3 dwellings.'*

Table 3-4 presents the bicycle parking requirements for compliance with the Councils DCP.

Table 3-4: Proposed bicycle parking supply

Land Use	Councils rates	Council bicycle requirements	Bicycle provisions
Apartments (32 Units)	Residential 1 space per 3 dwellings	10.7	16 Bicycle parking spaces provided on-site

The proposed development provides 16 bicycle parking spaces on the basement car park and ground floor, thus complying with Council DCP bicycle parking requirements.

3.4 Car park layout

Table 3-5 identifies the characteristics of the proposed parking areas with respect to the Council requirements. The last column identifies the compliance of each design aspect.

Table 3-5: Parking design requirement (residential units)

Design Aspect	Council / AS 2890 Requirements	Proposed Provision	Compliance
Parking space length: – Standard bay – Adaptable bay – Accessible bay – Visitor Bay	 5.4m (min) 5.4m (min) 5.4m (min) 5.4m (min)	 5.4m 5.4m 5.4m 5.4m	 Compliant Compliant Compliant Compliant
Parking space width: – Standard bay – Adaptable bay – Accessible bay – Visitor Bay	 2.4m (min) 3.8m (min) 4.8m (min) 2.4m (min)	 2.5m 3.8m 4.8m 2.5m	 Compliant Compliant Compliant Compliant
Access Driveway Width	3.0 to 6.0m	6m	Compliant
Aisle Width: Parking aisle Circulation aisle/ramp	5.8m (min)	5.8m (minimum)	Compliant
Parking envelope clearance - Column adjacent to bay	Located between 0.75m and 1.75m of aisle	Located between 0.75m and 1.75m of aisle	Compliant
Blind Aisle	1m extension beyond the last parking space	Minimum 1m extension beyond the last parking space	Compliant
Ramp Width – two way	6.1m (wall to wall)	6.4m (wall to wall)	Compliant

Design Aspect	Council / AS 2890 Requirements	Proposed Provision	Compliance
Ramp Grade Transitions	Up to 18% for 2m transitions	12.5% for 2m transition	Compliant
Maximum Gradient Ramp	Up to 20m long – 1 in 4 (25%)	25%	Compliant
Access Driveway	First 6m from the property boundary shall be a maximum of 1:20 (5%)	First 4.5m from the property boundary has a gradient of 1:20 (5%)	Refer to Section 3.4.1
Height Clearance: General Min. Over PWD bay	 2.2m 2.5m	 2.2m (minimum) 2.5m (minimum)	 Compliant Compliant

Table 3-6: Garage parking design requirement (Townhouses)

Design Aspect	Council / AS 2890 Requirements	Proposed Provision	Compliance
Garage length – 2 adjacent vehicles	10.8m (min)	11m	Compliant
Garage width - 2 adjacent vehicles	5.4m (min)	5.4m	Compliant
Garage door width	4.8 (min)	5.2m	Compliant

3.4.1 Access driveway

The proposed access driveway does not strictly comply with AS2890 with the maximum grade of 1:20 (5%) for the first 6 metre from the property boundary into the car park. The proposed access driveway to the basement car park has a gradient of 5% for the first 4.5 metres from the property boundary. The proposed access driveway is considered acceptable for the following reasons:

- A pedestrian footpath is located about 1.8 metre away from the property boundary. Thus the proposed access driveway to the basement car park has a gradient no greater than 5% for the first 6.3 metres from the pedestrian footpath; and
- Sufficient sight distance will be provided at the access driveway exit.

3.4.2 Tandem car parking spaces

Pittwater 21 DCP Part B & Part C states that: *tandem parking spaces may be permitted where all of the following criteria are met:*

- *Two parking spaces have been allocated per two or more bedroom apartments;*
- *The proportion of tandem parking spaces does not exceed 10% of the total residential parking for two or more bedroom units; and*

- *It can be clearly demonstrated that vehicles parked are directly associated to a single dwelling/unit and that such vehicles do not restrict or impede the parking, manoeuvring or access of other vehicle.*

Four sets of tandem parking bays are provided in the basement car park (see Figure 3-1), and each set (two parking spaces) will be allocated per two bedroom apartment. With 28 two or more bedroom units, the provision of tandem parking spaces is one set over Council's requirement.

It is noted that three sets of tandem parking spaces will be located at the end of a parking aisle. This will minimise the manoeuvring impacts of tandem space vehicles on the manoeuvring of other vehicles. The fourth set of tandem parking spaces will be accessed through another parking aisle. Based on The RTA (RMS) Guide to Traffic Generating Developments these four 2 - bedroom apartments will generate up to two vehicle trips during the peak hour (refer to Section 6). It is our advice that access of these four sets of tandem parking spaces can be managed in an acceptable level without significantly impeding or impacting other manoeuvring vehicles.

The proposed four sets of tandem parking spaces are considered acceptable based on the total number of car spaces and the location of the tandem spaces.

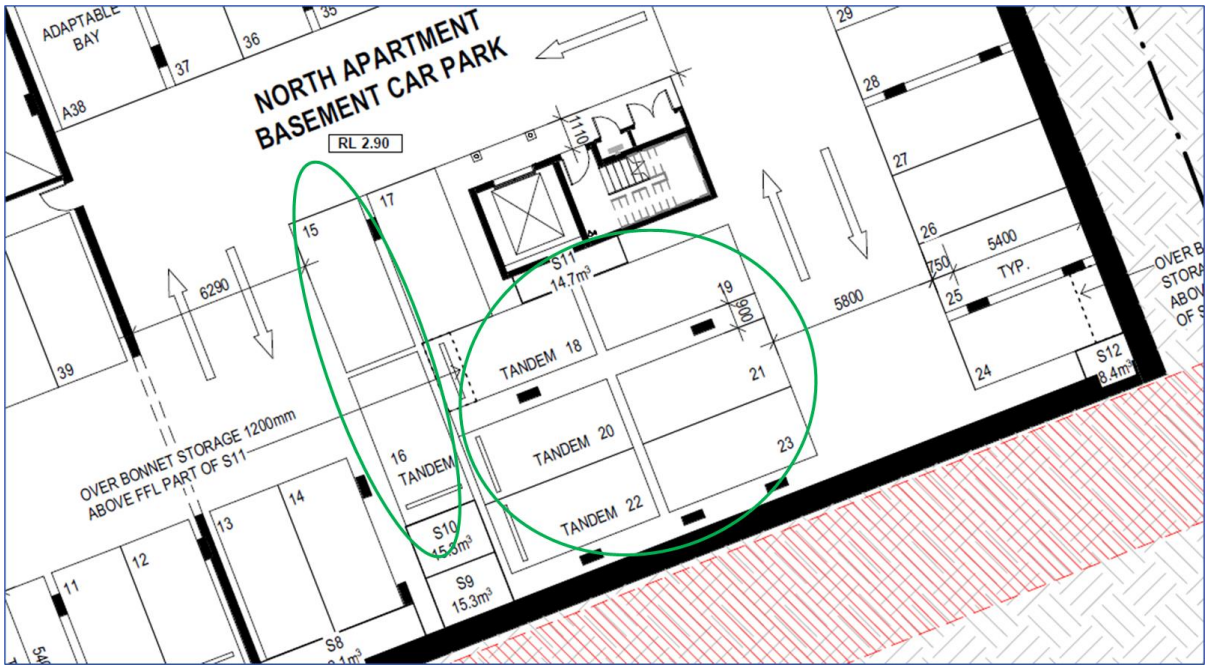

Figure 3-1: Tandem spaces in the basement car park

4 Proposed Laneway

Council's DCP-Part C and Warriewood Valley Roads Masterplan_2018 specify the cross section and dimensions of a typical residential laneway. A typical road plans and cross section of a residential laneway is presented in Appendix A5 of Warriewood Valley Roads Masterplan_2018, as shown in Figure 4-1.

A 7 metre wide laneway will be constructed to provide access to the proposed townhouses. A swept path analysis has been conducted to demonstrate that a B99 vehicle entering onto the laneway from Lorikeet Grove and exiting onto Lorikeet Grove (see Appendix B). it is our advice that the proposed laneway design complies with Council's requirements.

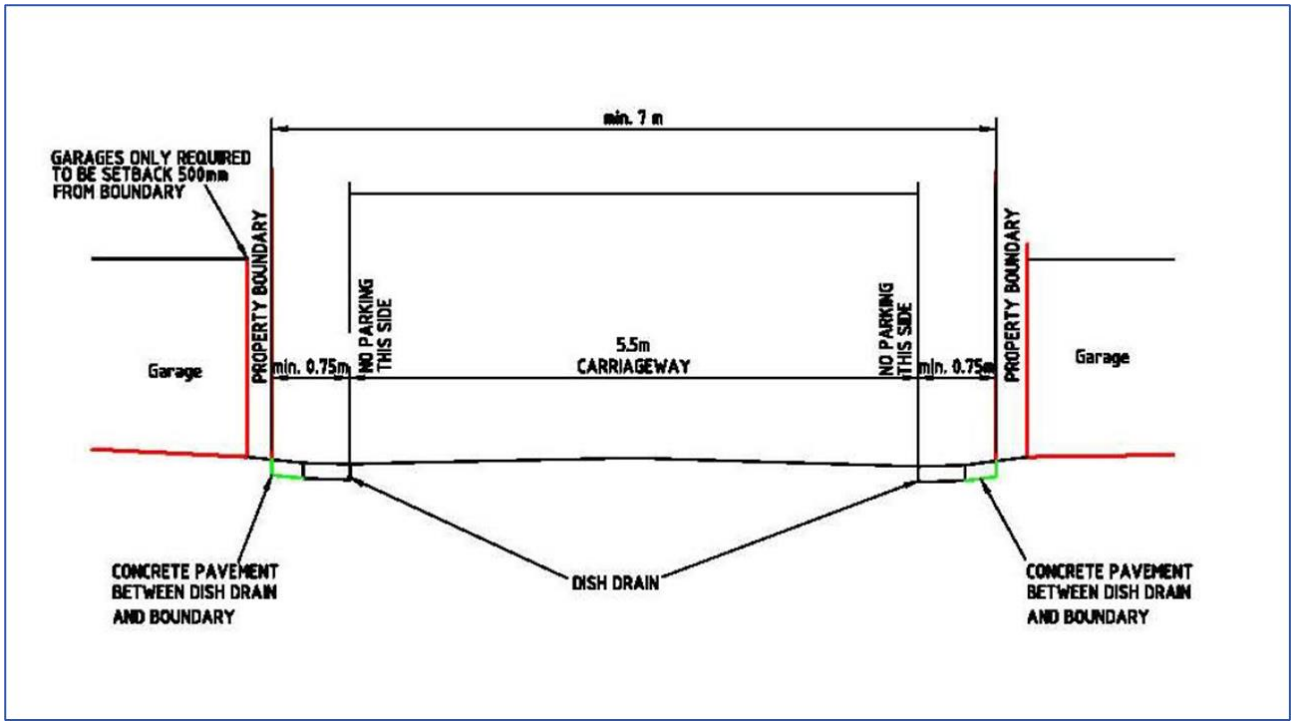

Figure 4-1: Typical cross section of a residential laneway[6]

[6] Source: Northern Beaches Council, Warriewood Valley Roads Masterplan_2018: Appendix A5.

5 Service Vehicles

The residential refuse of the apartment will be collected by southbound waste vehicles on Lorikeet Grove.

A bin storeroom will be allocated on the northwest side of the site boundary. Bins will be wheeled out to the bin storeroom from the refuse room before waste collection.

TTM has been advised that bins will be serviced by a rear lift vehicle. The waste vehicle coming from north of Lorikeet Grove will be pulled up at the side of the road. The stopping area of the waste truck will be at least 10 metres from the intersection up north of Lorikeet Grove.

The residential refuse of the townhouses will be collected from Warriewood Road, in the frontage of the site.

It is our advice that the proposed service vehicle arrangement is considered acceptable for the development.

Further information is contained in the waste report prepared separately by TTM Consulting.

6 Impact of Proposed Development

The RTA (RMS) Guide to Traffic Generating Developments specifies land use traffic generation rates for the proposed development, as presented below:

Table 6-1: Traffic Generation Rates

Land Use	RMS Traffic Generation Rates (Medium Density Residential Flat building)	Maximum Vehicles Trips (peak hour)
Residential Units		
26 x one / two bedrooms	Up to 2 bedrooms: 0.4 - 0.5 vehicle trips / dwelling	13
6 x three bedrooms	3 bedrooms or more: 0.5 - 0.65 vehicle trips/dwelling	3.9
Town Houses / Dwelling House		
11 town houses	0.5 - 0.65 vehicle trips/dwelling	7.15
Total Traffic Generation		**24 vehicle trips**

The traffic generation potential of up to 24 vehicles in the morning and evening peak periods is relatively minor and not of a level normally associated with unacceptable traffic implications in terms of road network capacity or traffic related environmental effect.

7 Conclusions

7.1 Development access

The proposed access complies with the Council requirements and is considered acceptable for the development.

7.2 Car parking arrangements

The proposed parking supply for the site satisfies Council parking requirements. The proposed car parking layout complies with AS2890 and AS4299 requirements.

TTM advises the proposed car parking arrangement for this development is acceptable.

7.3 Impact on surrounding road network

Assessment of the proposed development indicates that the development will not have a significant impact on the road network.

7.4 Service vehicle arrangements

Servicing for the residential flat building will be facilitated along Lorikeet Grove and the residential refuse of the townhouses will be collected from Warriewood Road, in the frontage of the site. The service vehicle arrangement is considered acceptable for the development.

7.5 Public transport and bicycle / pedestrian facilities

The current public transport infrastructure and proposed site provisions for pedestrian and bicycle facilities is considered adequate for the development.

7.6 Conclusion

TTM see no traffic engineering reason why the relevant approvals should not be granted

Appendix A Proposed Site Plan

LEGEND

THIS DRAWING IS TO BE READ IN CONJUCTION WITH THE LANDSCAPE DOCUMENTS

- CONCRETE FOOTPATH
- STONE FOOTPATH
- GARDEN
- GRASS
- PLANTER BOX
- PERMEABLE PAVING / PARKING
- PRIVATE OPEN SPACE - BALCONY / TERRACE
- PRIVATE OPEN SPACE - GARDEN
- TREE - PROPOSED REFER TO LANDSCAPE PLAN FOR DETAILS
- RAINWATER TANK - REFER TO PLANS FOR LOCATIONS
- WINDOW WITH BI-FOLD SHUTTERS REFER TO DRAWING DA - 260

V / A
A R C H I T E C T S

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REV	DESCRIPTION	DATE	BY
DA1	ISSUE FOR CO-ORDINATION	20.03.2020	TM
DA2	UPDATED APARTMENTS AND BASEMENT	08.04.2020	TM
DA3	DRAFT ISSUE FOR DEVELOPMENT APPLICATION	20.04.2020	MH
DA4	ISSUE FOR DEVELOPMENT APPLICATION	06.05.2020	TM
DA5	ISSUE FOR STRADA REVIEW	18.05.2020	MH

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KEY PLAN

STATUS

DEVELOPMENT APPLICATION

NORTH POINT

PROJECT
WARRIEWOOD RESIDENTIAL DEVELOPMENT

ADDRESS
25 - 27 WARRIEWOOD ROAD, NSW 2102

CLIENT
KNOWLES GROUP

DRAWING TITLE
PROPOSED APARTMENT GROUND FLOOR PLAN / DWELLING LOWER LEVEL FLOOR PLAN

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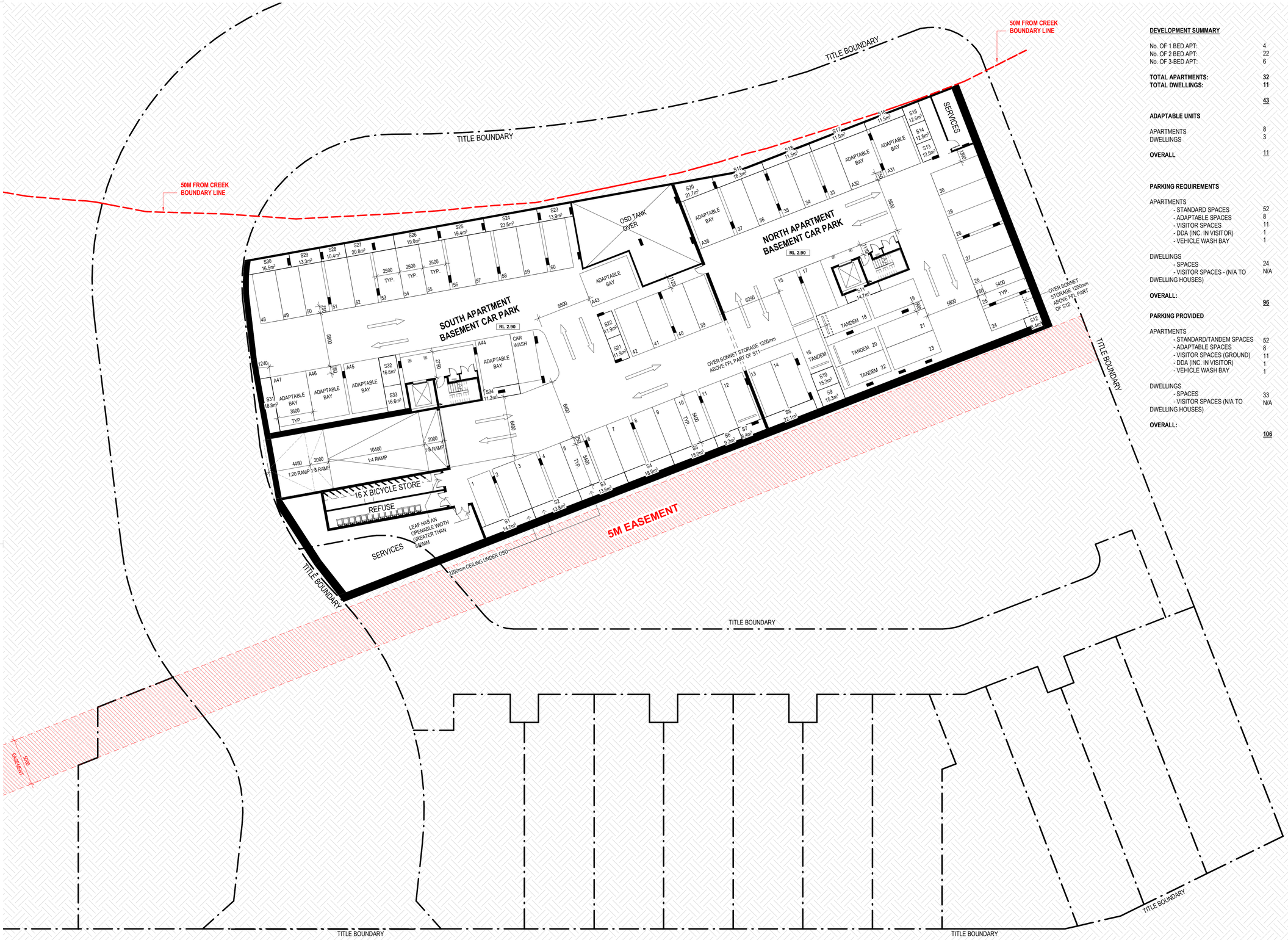

DEVELOPMENT SUMMARY

No. OF 1 BED APT:	4
No. OF 2 BED APT:	22
No. OF 3-BED APT:	6
TOTAL APARTMENTS:	**32**
TOTAL DWELLINGS:	**11**
	43

ADAPTABLE UNITS

APARTMENTS	8
DWELLINGS	3
OVERALL	**11**

PARKING REQUIREMENTS

APARTMENTS	
- STANDARD SPACES	52
- ADAPTABLE SPACES	8
- VISITOR SPACES	11
- DDA (INC. IN VISITOR)	1
- VEHICLE WASH BAY	1
DWELLINGS	
- SPACES	24
- VISITOR SPACES - (N/A TO DWELLING HOUSES)	N/A
OVERALL:	**96**

PARKING PROVIDED

APARTMENTS	
- STANDARD/TANDEM SPACES	52
- ADAPTABLE SPACES	8
- VISITOR SPACES (GROUND)	11
- DDA (INC. IN VISITOR)	1
- VEHICLE WASH BAY	1
DWELLINGS	
- SPACES	33
- VISITOR SPACES (N/A TO DWELLING HOUSES)	N/A
OVERALL:	**106**

APARTMENT NUMBER	NO. OF BEDROOMS	CARPARK NUMBER	STORAGE NUMBER
GROUND FLOOR			
STANDARD APARTMENTS			
APT. G01 - N	2	39, 40	S21
APT. G03 - N	2	24, 25	S12
APT. G04 - N	2	9, 10	S5
APT. G05 - N	2	20 TANDEM, 21	S13
APT. G06 - N	2	22 TANDEM, 23	S9
APT. G07 - S	2	41, 42	S22
APT. G09 - S	3	52, 53	S27
APT. G11 - S	2	58, 59	S24
ADAPTABLE APARTMENTS			
APT. G02 - N	2	17, A38	S20
APT. G08 - S	1	A47	S31
APT. G10 - S	2	A46, 50	S29, S32

FIRST FLOOR			
STANDARD APARTMENTS			
APT. 1.01 - N	2	13,14	S8
APT. 1.03 - N	2	15, 16 TANDEM	S10
APT. 1.04 - N	2	26, 27	S14
APT. 1.05 - N	1	11	S6
APT. 1.06 - N	1	12	S7
APT. 1.07 - N	2	18 TANDEM, 19	S11
APT. 1.08 - S	2	1, 2	S1
APT. 1.10 - S	2	56, 57	S25
APT. 1.11 - S	3	48, 49	S30
APT. 1.13 - S	2	7, 8	S4
ADAPTABLE APARTMENTS			
APT. 1.02 - N	2	30, A31	S16
APT. 1.09 - S	1	A44	S34
APT. 1.12 - S	2	A45, 51	S28, S33

SECOND FLOOR			
STANDARD APARTMENTS			
APT. 2.01 - N	3	36, 37	S19
APT. 2.02 - N	3	28, 29	S15
APT. 2.03 - N	2	34,35	S18
APT. 2.06 - S	2	3, 4	S2
APT. 2.07 - S	3	54, 55	S26
APT. 2.08 - S	3	5, 6	S3
ADAPTABLE APARTMENTS			
APT. 2.04 - N	2	A32, 33	S17
APT. 2.05 - S	2	A43, 60	S23

VISITORS / DDA

VISITORS - GROUND	V1
	V2
	V3
	V4
	V5 (DDA)
	V6
	V7
	V8
	V9
	V10
	V11

V / A
ARCHITECTS

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KEY PLAN

STATUS

DEVELOPMENT APPLICATION

NORTH POINT

Quality ISO 9001 Environment ISO 14001 Health & Safety AS 4801

PROJECT
WARRIEWOOD RESIDENTIAL DEVELOPMENT

ADDRESS
25 - 27 WARRIEWOOD ROAD, NSW 2102

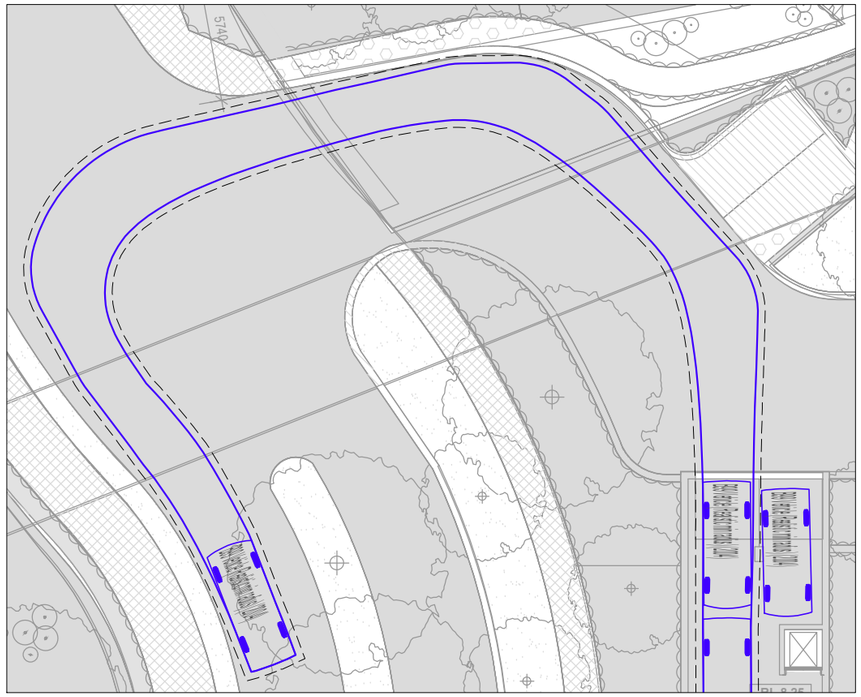
CLIENT
KNOWLES GROUP

DRAWING TITLE
OVERALL FLOOR PLAN - BASEMENT

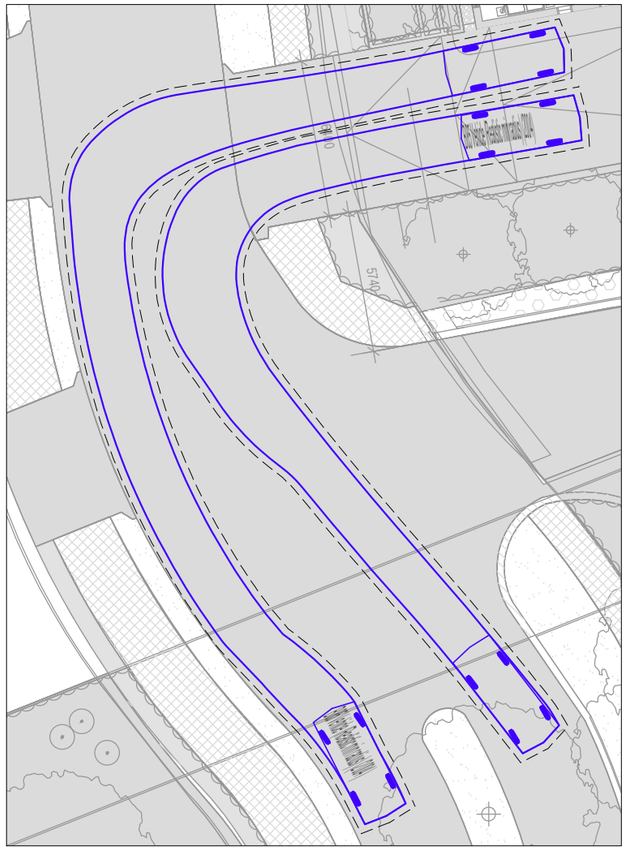
SCALE (@A1)	DRAWN BY	CHECKED BY	PROJECT No.	DRAWING No.	REV
1 : 200	JC	MA	1510121	DA - 105	DA5

Appendix B Swept Path Analysis

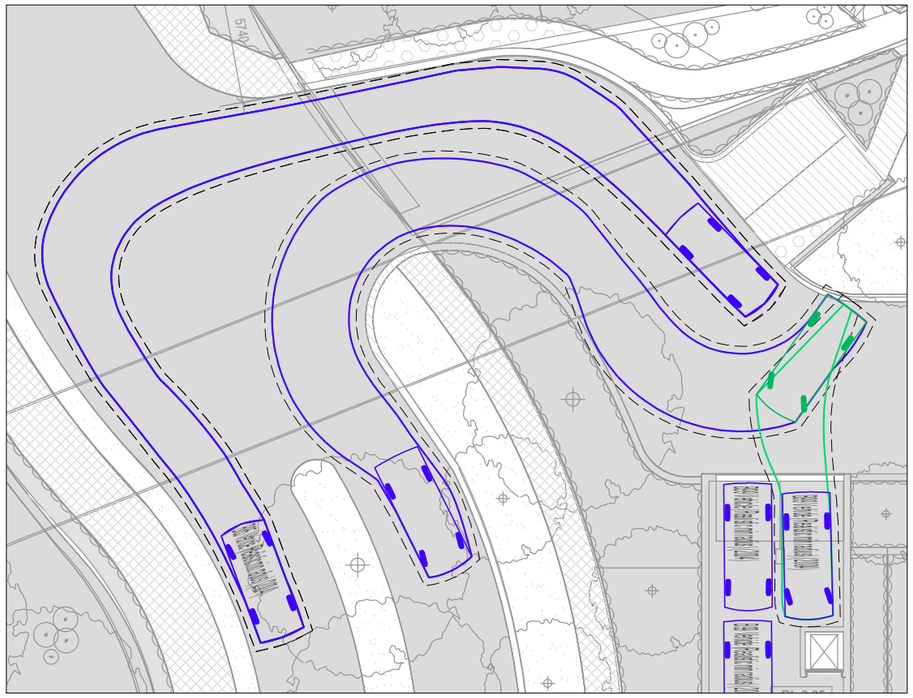
UNIT 1 - GARAGE BAY 2 ENTRY



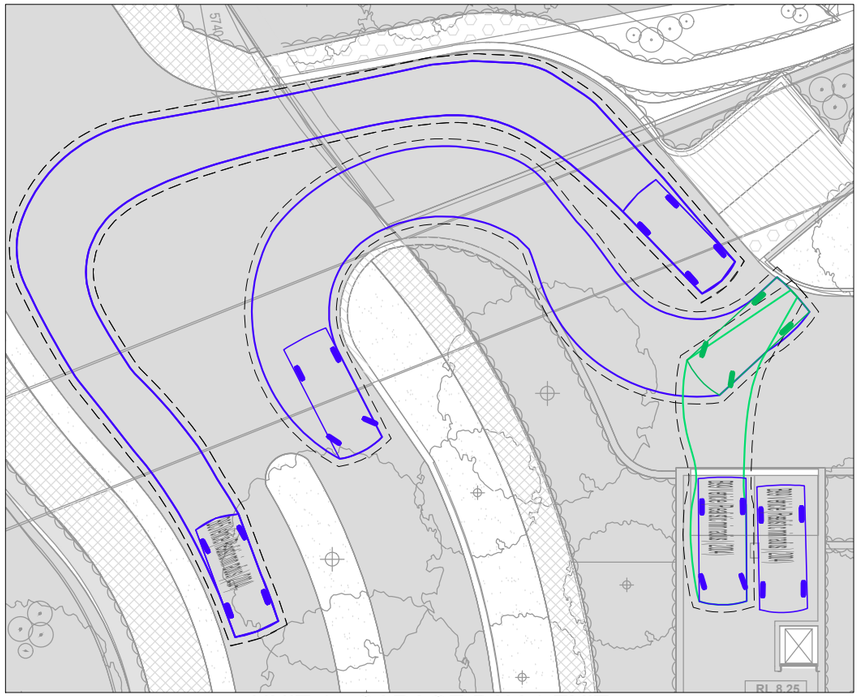
UNIT 1 - GARAGE BAY 1 ENTRY



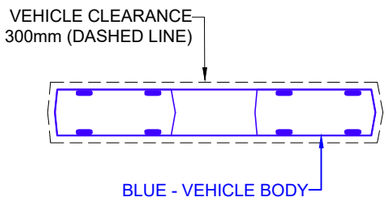
RAMP CIRCULATION ACCESS

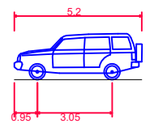


UNIT 1 - GARAGE BAY 2 EXIT



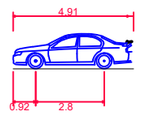
UNIT 1 - GARAGE BAY 1 EXIT





B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	08-05-20	ORIGINAL ISSUE	LD	PC	PC

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

CLIENT
KNOWLES INVESTMENTS

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E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT
25 - 27 WARRIEWOOD ROAD, WARRIEWOOD

DRAWING TITLE
SWEPT PATH ANALYSIS
DESIGN VEHICLE - B99 & B85

PROJECT NUMBER	ORIGINAL SIZE
20SYT0007	A3
DRAWING NUMBER	REVISION
20SYT0007-01	A
DATE	SHEET
8 May 2020	1 OF 1

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